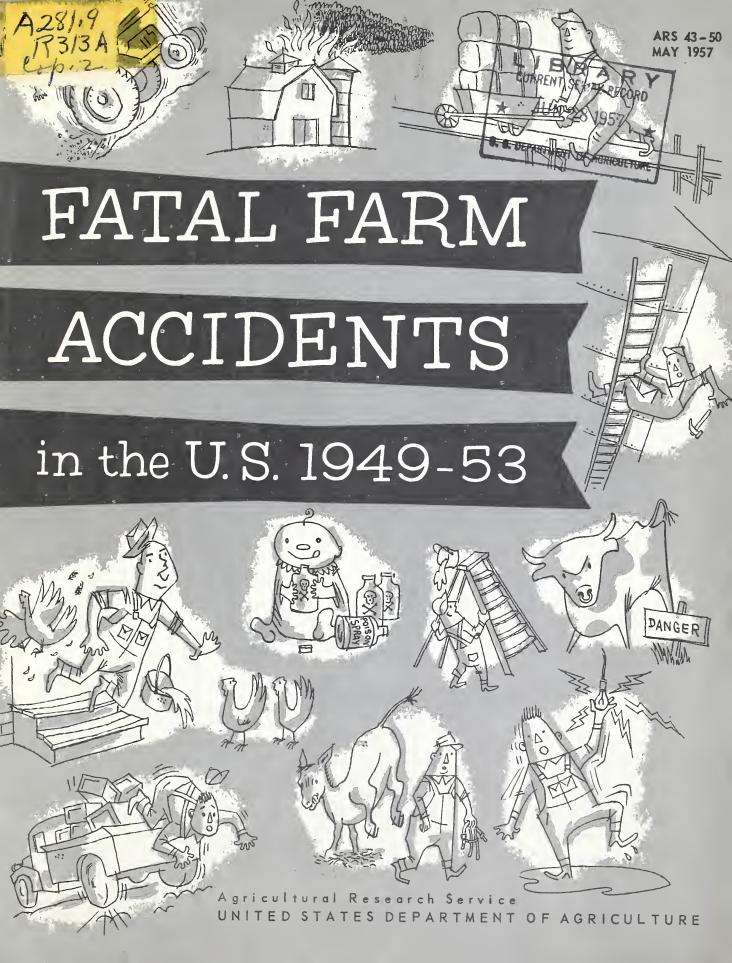
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CONTENTS

							4	à																										age	
FI	NDING	s.	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4	
TH	E PRO	BLE	M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4	
AN	ALYSI	s o	F V	ΊΊ	ΆL	s	TA	TI	SI	CIC	cs	DA	\TA	٠,	19	949	9-5	3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7	
(Cause	s.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7	
	By	age	gr	ou	ps	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7	
	By	reg	ior	ıs	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13	
	By	sex	of	v	ic	ti	m	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13	
]	Fatal	ity	rs	te	s	pe	r	10	0,	,00	00	ſε	rn	ı	ec	pl	.e	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13	
]	Month	of	00	cu	rr	en	ce	0	f	f٤	ete	ıli	ti	.es	S .	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	15	
]	Data	ру	Sta	te	s				•	•	•		•		•	•	•		•															16	

Prepared in

Farm Economics Research Division

Agricultural Research Service

United States Department of Agriculture

FATAL FARM ACCIDENTS, UNITED STATES, 1949-53

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This is the fourth in a series of analyses of fatal farm accidents made from data supplied by the National Office of Vital Statistics. 1/ The more recent data, which cover the years from 1949 to 1953, include some information on causes of accidents not previously available. It is hoped that these studies will provide a basis for a better understanding of the accident problem on farms.

The data now cover 14 years (1940-53). Altogether, they account for a total of 30,521 fatalities resulting from farm accidents. Because of a change in classification based on the Sixth Revision of the International Lists of Causes of Death, first used in 1949, there is a change in the comparability of the data as between the first and the latter parts of the series. 2/ Essentially, the change is in the direction of tabulating as fully as possible all fatal accidents that occur on farmland and in and around farm service buildings. Therefore, data on fatal accidents in the farm home and away from the farm, are excluded. Because of this limitation of the data, additional sources were drawn upon to give the whole picture on accidents to farm people, including those that occur in the farm home and off the farm, and the nonfatal but disabling accidents.

^{1/} See Analysis of 7,851 Fatal Farm-Work Accidents in the United States, 1940-43, July 1945; Fatal Accidents in Farm-Work, September 1949; and Analysis of 17,906 Fatal Farm-Work Accidents in the United States, 1940-48, April 1951.

^{2/} The change in classification of farm-accident fatalities in the Sixth Revision of the International Lists of Causes of Death, first used in 1949, has broadened the base for the more nearly complete tabulation of the fatal accidents that occur on farms. Before the revision, farm-accident fatalities were tabulated basically from death certificates. The certificate describes the farming activity associated with the death, such as the use of farm machinery or the handling of farm animals. But beginning in 1949 fatal farm accidents were tabulated on the basis of a more complete account of events occurring on the farmland and in and around service buildings. This tended to bring in more fatal accidents to children and others not necessarily associated with some farming activity. Fatal accidents in the farm home and away from the farm, such as traffic accidents, were excluded in all these series.

FINDINGS

A little more than a fourth of the fatal accidents to farm people during 1949-53 occurred on the farm but outside the home. Far too many were young people who either had not acquired the skills necessary to avoid accidents or were not properly safeguarded by their parents. Farm machinery ranked first as a cause of these fatalities. Other major causes of fatalities included drownings, firearms, and falls.

The age group 15 to 19 suffered the greatest number of fatal accidents, followed in order by the 10 to 14 and the under 5 age groupings. Males sustained about 91 percent, and females 9 percent, of the fatalities. Fatal accidents to girls under 5 years of age occurred at more than twice the average rate of 2.1 per 100,000 females. For boys in the same age group, the accident rate was only half the average rate of 18.5 for all males. Women 75 and older sustained fatalities nearly 4 times the 2.1 average for all females. For men in this older age group, the accident rate was nearly 3 times the average of 18.5 for all males. Of all females, women from 20 to 60 had the lowest fatality rates.

THE PROBLEM

Although gains have been made in collecting information relating to accidents, much remains to be done before accidents can be reported adequately. For instance, reporting of fatal accidents is better than reporting of non-fatal accidents, even those of a serious nature. The vital statistics bureaus in the States collect the original data from death certificates. Except for the estimates made by the National Safety Council, there is no organized program of collecting and analyzing nonfatal but disabling and, therefore, loss-of-time accidents among farm people.

Very little is known about how people respond to hazardous situations and how safety-mindedness can be developed. It is known that individuals differ as to degree of accident proneness. Some look for causes of accidents and are more alert in preventing them than others.

A few studies indicate that accidents tend to peak around 10 a.m., but the reason is not known. These studies indicate also that there may be two afternoon peaks - around 3 p.m. and around 6 p.m. Fatigue and consequent carelessness (or lack of alertness) may contribute to these afternoon peaks.3/

It has been pointed out also that traffic accidents appear to reach a peak at dusk. This indicates that drivers may fail to make the adjustments necessary for safe driving during the change from daylight to dark.

^{3/} See Farm Accidents in Indiana, Ind. (Purdue) Agr. Expt. Sta. Bul. 562, March 1951.

Table 1.- Number of fatal accidents on farms, by 3 principal causes, United States, 1940-53

		:	Average pe	er year	
Period	Number	Machinery	Animals	Other	Total
		<u>Number</u>	Number	Number	Number
1940-43: 1944-45: 1946-48: 1949-53 1/:	7,851 4,290 5,765 12,615	916 1,028 935 785	403 347 257 160	644 770 730 1,578	1,963 2,145 1,922 2,523
14 years:	30,521	889	277	1,014	2,180

^{1/} Includes deaths from accidents on farms (by place of residence). Classifications as to type of accident are based on the International Lists of Causes of Death and, since 1948, on the Sixth Revision of this listing.

Department of Health, Education and Welfare, Public Health Service, National Office of Vital Statistics. (Comparability of the series by principal cause is somewhat affected by changes in method of classification. See footnote 2, p. 3.)

During the 14 years in which these 30,521 fatal accidents occurred, the average annual number of such fatalities tended to increase slightly (table 1). This increase was due partly to a change in the classification system begun in 1949. The number of fatalities caused by machinery tended to increase toward the middle, and to decline toward the end, of the period. A few farm safety programs were started during the last half of this period. They were directed particularly against accidents caused by machines. These programs may have contributed to the decline in such accidents. Fatalities caused by animals declined throughout the period, mainly because of the displacement of horses and mules by tractors. As the number of workstock declined, exposure to injury from handling them was reduced.

Although the farm population declined by approximately 25 percent, or from 30.5 to 22.7 million between 1940 and 1953, fatality rates per 100,000 farm people increased substantially during this period (table 2). 4/ The increase was from 6.7 per 100,000 farm persons during 1940-43 to 10.3 during 1949-53. 5/ For farm machinery, fatality rates rose and then fell slightly during the latter part of the 14-year period. Fatality rates for accidents caused by animals declined, particularly during the latter part of the period.

^{4/} As indicated in footnote 2, changes in classification in 1949 affect the comparability of the data in table 2.

^{5/} Based on estimates of the National Safety Council of farm-work accidents alone, the rate was 60 percent higher than this, or 16.5 per 100,000 farm people, during 1949-53.

Table 2.- Fatal farm accidents per 100,000 people, by periods and by principal causes, United States, $1940-53 \frac{1}{2}$

		Cause		
Period	Machinery	Animals	Other	Total
	Number	Number	Number	Number
1940-43 1944-48 1949-53	3.1 3.7 3.2	1.4 1.1 .6	2.2 2.9 6.5	6.7 7.7 10.3
Average 1949-53:	3.4	1.1	3.8	8.3

^{1/} Average number of fatalities during period divided by average farm population (as of April 1) during period, as shown in Agricultural Statistics, 1955, table 625. Changes in classification in 1949 affect somewhat the comparability of the rates between periods.

Table 3.- Annual average number of accidents to farm residents, by type of accident and place of occurrence, 1950-55

Item	Fatal	ities	Injuri	es
	Number	Percent	Number	Percent
Motor vehicle Home Farmwork 1/ Off farm but not	3,333	42 24 27	210,000 548,333 321,667	17 46 26
involving motor : vehicles:	1,133	8	140,000	12
Total <u>2</u> /	14,000	101	1,200,000	101

^{1/} Duplication of 366 fatalities and 20,000 injuries as between motor vehicle and work accidents.

National Safety Council.

^{2/} Reflects some duplication in reporting methods.

Work-connected accidents apparently account for about a fourth of all accidental injuries and fatalities to farm people, according to estimates of the National Safety Council (table 3). The National Safety Council has developed an estimate, based on its more dependable fatalities series, of the number of disabling injuries. The estimate is based on a ratio of about 1 fatality to upward of 100 disabling injuries to farm people. 6/ It should be borne in mind that this report covers only a small segment of the total number of accidents of varying degrees of severity that involve farm people.

ANALYSIS OF VITAL STATISTICS DATA, 1949-53

Vital statistics data supplied before 1949 provided only three cause-of-accident categories - machinery, animals, and other accidents occurring in the course of agricultural operations. However, the more recent data, those for 1949-53, include all deaths reported as having occurred as a result of accidents on the farm. Therefore, the list is more extensive and includes burns from fire and hot substances, drownings, firearms, blows from falling objects, electricity, and lightning. It was possible, therefore, to analyze these later data in greater detail.

During 1949-53, nearly a third of the fatal accidents on farms were associated with the use of machinery (table 4). Following, in order of importance, were drownings, firearms, and falls. An additional third of the fatal accidents on farms were caused by drownings, firearms, and falls (fig. 1).

It is possible to compare for one State - South Carolina - two different methods of collecting data on fatal accidents that occurred from 1949 to 1953. In South Carolina, 153 fatalities were recorded from vital statistics, while data on 823 fatalities to farm and rural people were collected from newspaper accounts. The data compiled from vital statistics excluded fatal accidents that occurred in the home and off the farm. In the latter case, there were no exclusions. A comparison of these two sets of data indicate that only 19 percent of the fatal accidents to rural residents occurred on farmland and around farm service buildings.

CAUSES

By Age Groups

The largest number of fatal accidents from all causes as reported in vital statistics involved those in the age group, 15 to 19, followed in order by the 10 to 14, and the under 5 age groups (fig. 2). These three age groups accounted for 26 percent of all fatalities in which the age of the victim was known.

The highest number of fatalities caused by machinery occurred to farm people between the ages of 55 and 59. Injuries caused by animals were most common among older people. Most of the fatalities from burns and drownings

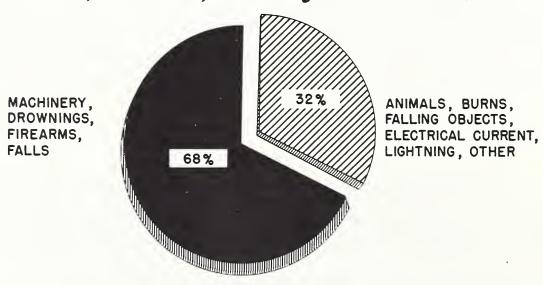
⁶/ In the data shown in table 3, this ratio is approximately 1 fatality to nearly 86 injuries (14,000 x 85.7 = 1,200,000).

Table 4.- Fatal accidents on farms, by cause, United States, 1949-53

Cause	Fatal a	accidents
:	Number	Percent
Machinery Drownings Firearms Falls Animals, insects Burns, hot substances Blow from falling object Electric current Lightning All other causes	3,924 1,624 1,597 1,394 800 779 758 404 394 941	31.1 12.9 12.7 11.0 6.3 6.2 6.0 3.2 3.1 7.5
Total:	12,615	100.0

Department of Health, Education and Welfare, Public Health Service, National Office of Vital Statistics.

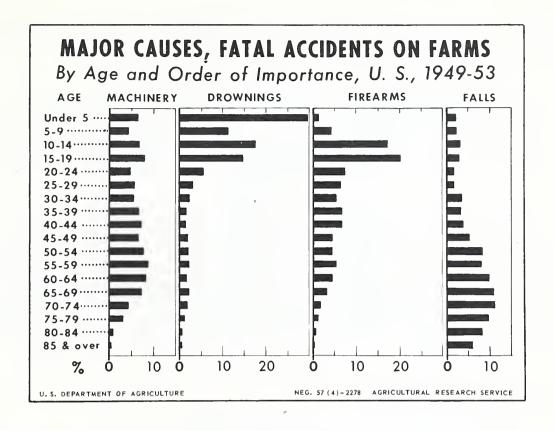
TWO-THIRDS OF FATAL ACCIDENTS ON FARMS Caused by Machinery, Drownings, Firearms, Falls, U.S.



U.S. DEPARTMENT OF AGRICULTURE

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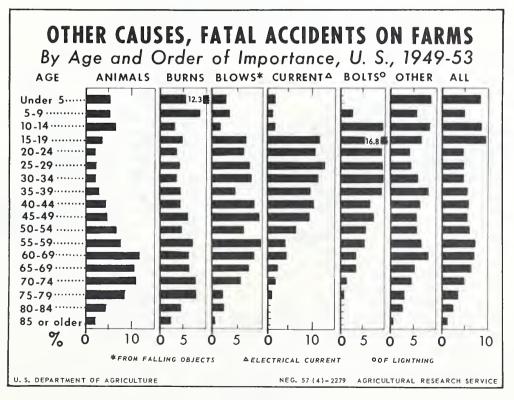


Figure 2

occurred to children under 5 years of age. Firearms and lightning took their highest toll among those between the ages of 15 and 19. Falls most frequently involved older people.

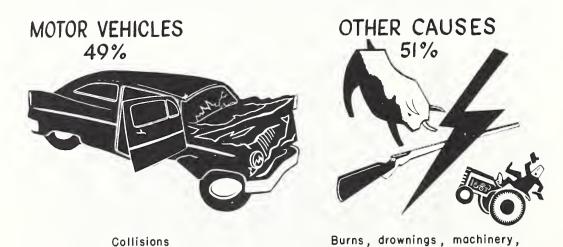
In the South Carolina data for rural residents, which covered the years from 1946 to 1955, and included traffic fatalities, almost 90 percent of the fatalities were accounted for by five causes. In order of importance they were: Motor vehicles, burns, drownings, firearms, and machinery. (See table 5, footnote 2.) Motor vehicles accounted for almost half of all fatalities (fig. 3). Other relationships by cause and by age groups are shown in figure 4.

In the South Carolina data, three types of accidents were caused by motor vehicles. In order of importance, they were collisions, overturns (including other motor-vehicle accidents not otherwise classified), and striking pedestrians as they crossed or walked on highways (fig. 5). Teenagers (15 to 19) were involved in more fatal collisions and overturns than any other age group. Those under 20 and those 60 and older accounted for 80 percent of all pedestrians who were fatally injured by motor vehicles (fig. 6). Nearly half, or 44 percent, of the pedestrians killed by motor vehicles were children under 10 years of age.

S.Carolina, 1946-1955 MOTOR VEHICLES ACCOUNT FOR ABOUT HALF OF FATALITIES

hit pedestrians

overturns *

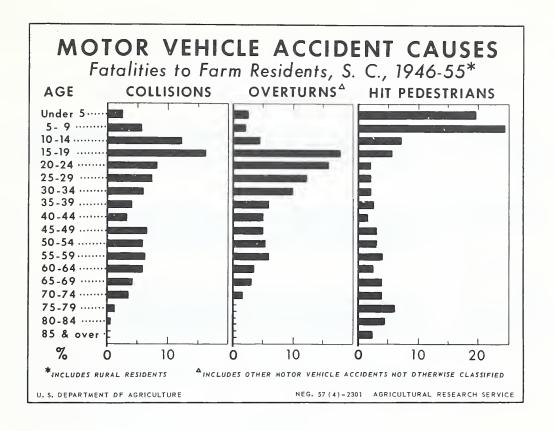


* Including other motor vehicle accidents not otherwise classified.

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firearms, lightning, animals,

falls, falling objects, and others.



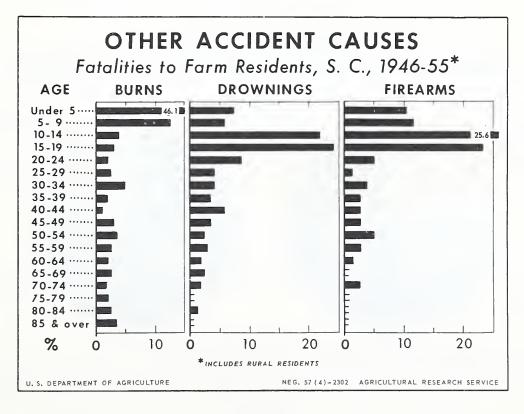
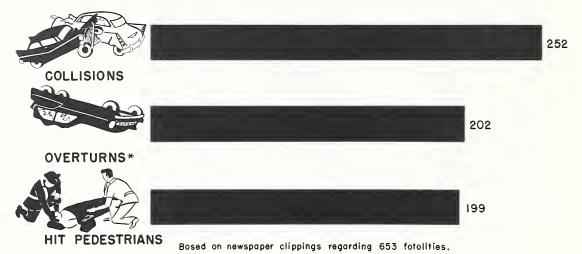


Figure 4

S. Carolina, 1946-1955

FATAL MOTOR VEHICLE ACCIDENTS to Farm and Rural Residents



st including other motor vehicle occidents not otherwise clossified.

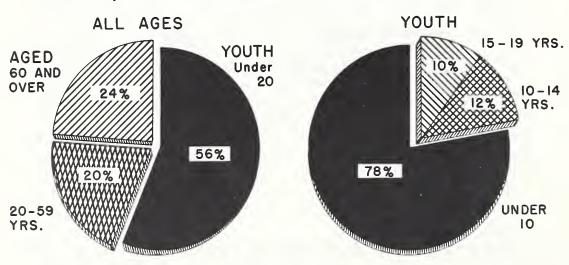
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Figure 5

YOUTH AND AGED Make up 80% of Pedestrian Fatalities, S.C., 1946-55



* Killed by motor vehicles while crossing or walking on highways.

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Table 5.- South Carolina: Fatal accidents on farms compared with all fatal accidents of farm and rural people, 1949-53

Cause or agency	Fatalities on farms (Vital Statistics) 1/	: All accident fatalities : (Newspaper accounts) 2/
:	Number	Number
Motor vehicles: Machinery:	3/ 31	<u>4</u> / 430 44 18
Animals: Burns or hot substance:	15 8	5/ 114
Drownings:	27	<u>4</u> / 99
Firearms:	25	<u>5</u> / 45
Blow from falling object:	13	2
Falls:	9	10
Lightning:	8	5/ 22
Electric current:	5	5/ 9
Miscellaneous:	12	
Total:	153	823

1/ As defined in footnote 2, page 3 of this report.

3/ Off-farm motor vehicle traffic accident fatalities not reported.

5/ Includes fatalities that occurred in the home.

By Regions

From 1949 to 1953, about a fifth of all fatal accidents on farms in the United States occurred in the Corn Belt (table 6). 7/ About an eighth occurred in the Northeastern and Appalachian States. The highest number of machinery-caused fatalities also occurred in the Corn Belt, and the lowest number in the Southeastern States. More fatalities were associated with the use of machinery than with any other cause. This was true in all regions except the Southern Plains, where drowning slightly exceeded machinery as a cause of accident fatalities. Differences among regions in the number of fatalities by causes are shown in table 6.

By Sex of Victim

About 91 percent of these accidents involved males and about 9 percent females (table 7). By regions, the percentage for males ranged from 93 percent of the total in the Pacific States to about 88 percent of the total in the Southern Plains States. 7/

Fatality Rates per 100,000 Farm People

Fatality rates in connection with accidents increase with age (fig. 7). Therefore, those in the older age groups are subject to the highest fatality

²/ Includes all types of fatal accidents to farm or rural people, without regard to place of occurrence.

Includes fatalities that occurred off the farm, such as traffic fatalities.

^{1/} For a listing of States in each region, see footnote 1, table 6.

Table 6.- Fatal accidents on farms, by regions and principal causes, 1949-53

					Cause	0					
Region 1/	Machin- ery	in-Drown- y ings	Fire- arms	Falls : r	Ani- mals, Burns, insects; scalds		Blows from fall-	Electric current	Light- ning	Other	Total
	Number	Number	Number	Number M	Number	Number 1	Number	Number	Number	Number	Number
Northeast	-: 1486	139	188	251	113	101	88	37	S	101	1,526
Corn Belt	-: 918	576	317	322	127	155	160	65	63	169	2,572
Lake States	-: 519	8	144	235	102	26	84	33	25	113	1,406
Appalachtan	-: 379	173	216	165	102	&	141	740	4	125	1,476
Southeast	-: 230	141	158	20	69	11	13	99	<i>L</i> 9	8	1,008
Delta States	184	132	66	30	20	6	99	56	74	છ	765
Southern Plains	-: 2 ¹ / ₁ ¹ / ₂	245	163	19	28	48	30	33	39	8	1,019
Northern Plains	-: 432	150	8	8	20	63	33	17	30	85	1,058
Mountain-	-: 245	160	%	8	8	41	31	33	51	47	88
Pacific	-: 287	116	117	32	94	44	45	82	4	69	905
United States	-: 3,924	1,624	1,597	1,394	800	779	758	404	394	941	12,615
1/ Northeast: Conne	Connecticut, I	Delaware,	, Maine	Maine, Maryland, Massachusetts,	nd, Mas	sachuset	- 1	New Hampshire,	- 1	New Jersey,	ey,

New York, Pennsylvania, Rhode Island, and Vermont.

Corn Belt: Illinois, Indiana, Iowa, Ohio, and Missouri.

Lake States: Michigan, Minnesota, and Wisconsin.

Appalachian States: Kentucky, North Carolina, Tennessee, Virginia, and West Virginia.

Southeast: Alabama, Florida, Georgia, and South Carolina.

Delta States: Arkansas, Louisiana, and Mississippi. Southern Plains: Oklahoma and Texas.

Kansas, Nebraska, North Dakota, and South Dakota. Northern Plains:

Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. California, Oregon, and Washington. Mountain States: Pacific States:

Table 7 Fatal accidents on farms, by regions and sex of victim, 1949-	Table	7 Fatal	accidents	on	farms.	bv	regions	and	sex	of	victim.	1949-	-53
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Region 1/ :	Ma.	les	: Fen	nales	•	Total
	Number	Percent	Number	Percent	Number	Percent
Northeast:	1,401	91.8	125	8.2	1,526	100.00
Corn Belt:	2,382	92.6	190	7.4	2,572	100.00
Lake States:	1,259	89.6	147	10.4	1,406	100.00
Appalachian:	1,352	91.6	124	8.4	1,476	100.00
Southeast:	905	89.8	103	10.2	1,008	100.00
Delta States:	685	89.6	80	10.4	765	100.00
Southern Plains:	893	87.6	126	12.4	1,019	100.00
Northern Plains:	962	90.9	96	9.1	1,058	100.00
Mountain:	782	88.9	98	11.1	880	100.00
Pacific:	842	93.0	63	7.0	905	100.00
United States-:	11,463	90.9	1,152	9.1	12,615	100.00

^{1/} For a listing of States in each region, see footnote 1, table 6.

rates. For those aged 60 or over, the fatality rate was about 3 times the rate for those under 20.

Analyses not included in the report indicate that there is little difference between fatality rates, by regions, for the various age groups - except perhaps for those in the older age groups. But at these ages the data were meagre. For age 85 and over, the rates were highest in the Northern Plain and Lake States. $\underline{8}$

The data based on newspaper accounts in South Carolina, which cover the years from 1946 to 1955, also emphasize the fact that accident fatality rates are highest for the older age groups. The lowest fatality rates involved the age group 5 to 9. But children under 5 were more subject to accident fatalities than were persons in other 5-year age groups under 20.

Month of Occurrence of Fatalities

The vital statistics data by place of accident for 1949-53 did not show the months in which fatalities occurred. But the data from newspaper accounts that covered fatal accidents to farm and rural people in South Carolina from 1946 to 1955 indicated that December led other months in number of fatalities. It was followed closely by July. Other above-average months were January, May, June, September, and November.

^{8/} For a listing of States in each region, see table 6, footnote 1.

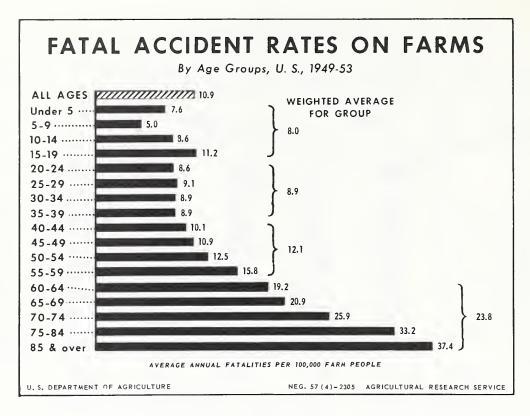


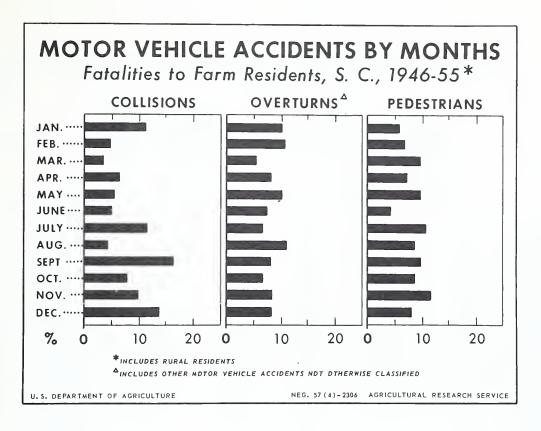
Figure 7

For the South Carolina data, a distribution of fatalities by causes and by months was available (fig. 8). As might be expected, drownings occurred mainly in May, June, and July. Burns occurred most frequently in November, December, January and February, when many farm people were exposed to open fireplaces and stoves. Motor vehicle collisions were most frequent in September; pedestrian fatalities, in November; and overturns and other types of fatalities caused by machinery were most frequent in August.

Data By States

Vital statistics data by States show that the largest number of farm-work-accident fatalities during 1949-53 occurred in Texas (727), followed in order by Pennsylvania (571), Illinois (555), Iowa (544), Wisconsin (528), Missouri (525), Ohio (522), and California (506). These data, by causes, are shown in table 8.

Machinery was the leading cause of fatalities in 43 States. Drowning was the leading cause in Arizona and Texas, and firearms led as a cause in Rhode Island and West Virginia.



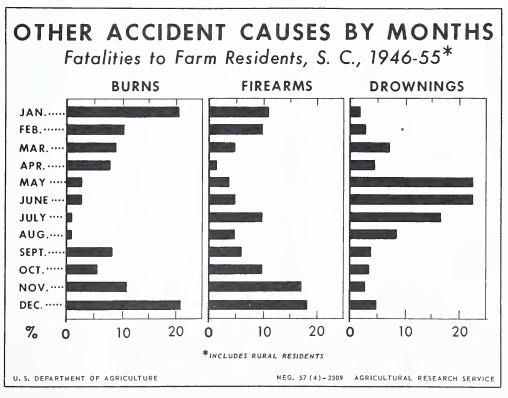


Table 8.- Fatal accidents on farms, by cause, sex of victim, and State, 1949-53

							-					: Sex	of
					Caus	e						vic	
					: :		: :	:	Blow	:	:	:	:
State	Ma-				: :		:Elec-:		from		•	:	:
Boate	ahin	Ani-		Drown-	:Fire-:	Light-	: tric:	Falla:	fall-		Total	Male	Female
	ery	mals:	341110	ings	: arms:	ning	cur-:		_			:	
					: :		: rent:	:				:	:
		·			: :		: :	:	ject			<u>. </u>	<u>:</u>
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Alabama	16	23	22	41	57	22	8	29	20	26	312	282 84	30
Arizona	_	3	3	30 42	7	3 14	10	5	6 2 6	18 26	101	265	17
Arkansas		25 19	29 30	63	43	14	12	15 62	18	38	295 506	473	30
Colorado		16	11	38	59 2 6	15	55 6		-	-	183		33 26
Connecticut	_	6	2	7	20	5	1	13 13	7	9 4	58	157 52	6
Delaware	-	2	1	Ó	3	1	i	2	3 2	i	18	17	1
Florida		8	23	22	16	18	16	14	10	11	176	162	14
Georgia		23	24	51	60	19	9	18	34	32	367	326	41
Idaho		16	5	23	14	4	6	13	5	8	141	129	12
Illinois		23	31	56	64	13	12	67	29	41	555	525	30
Indiana		23	26	31	53	14	11	68	37	17	426	394	32
Iowa		23	29	58	62	19	16	63	33	38	544	494	50
Kansas		21	21	62	33	12	9	34	11	29	374	336	38
Kentucky		20	16	40	58	13	10	51	19	25	340	311	29
Louisiana		9	19	26	17	14	4	6	14	10	159	145	14
Maine		6	1	4	7	ì	ī	9	6	7	55	52	3
Maryland		6	12	16	9	ō	4	ıí	8	9	106	95	ıĭ
Massachusetts	Ŭ.	6	3	4	7	ĭ	Ö	11	ī	7	54	52	2
Michigan		25	20	18	49	8	13	68	21	22	387	353	34
Minnesota	_	31	21	47	53	8	9	64	27	41	491	439	52
Mississippi:	-	16	21	64	39	19	10	9	26	26	311	275	36
Missouri		23	30	80	74	- 8	8	47	37	32	525	489	36
Montana		12	9	26	23	6	5	11	5	21	186	164	22
Nebraska		17	21	43	29	11	Ĺ	40	8	21	328	303	25
Nevada		4	1	2	4	0	0	4	0	2	21	19	ź
New Hampshire:	7	2	2	2	4	1	Ō	6	2	3	29	28	1
New Jersey		5	8	12	12	1	1	15	0	7	83	80	3
New Mexico		13	7	20	8	15	1	7	3	3	102	91	11
New York	159	40	29	38	56	4	14	85	27	34	486	442	74.74
North Carolina:	109	17	28	50	52	15	8	2 6	50	38	393	355	38
North Dakota:	73	5	11	23	21	2	0	10	6	10	161	147	14
Ohio:	164	35	39	51	64	9	18	77	24	41-	522	480	42
Oklahoma:	81	17	15	78	48	9	5	16	6	17	292	259	33
Oregon:	54	12	5	24	27	1	16	11	15	12	177	165	12
Pennsylvania:		33	40	53	79	7	14	89	34	26	571	522	49
Rhode Island:	2	1	0	0	3	0	0	1	0	0	7	7	0
South Carolina:		15	8	27	25	8	5	9	13	12	153	135	18
South Dakota:		7	10	22	16	5	4	15	8	25	195	176	19
Tennessee:		514	15	46	34	9	12	36	26	26	314	288	26
Texas:		41	69	167	115	30	28	45	24	45	727	634	93
Utah:		13	2	11	5	1	4	8	1	3	76	72	4
Vermont:		6	3	3	6	1	1	9	_5	3	59	54	5
Virginia:		27	19	29	36	8	8	32	26	22	273	254	19
Washington:	72	15	9	29	31	2	11	22	12	19	222	204	18
West Virginia:		14	11	8	36	1	2	20	20	14	156	144	12
Wisconsin:		46	15	27	42	9	11	103	39	50	528	467	61
Wyoming	15	6	3	10	9_	7_	<u>l</u>	5_	4	10	70	66	4
11-24-3 Cl-4	2 001	900	770	1 (0)	3 507	201	hol.	201	750	Ola I	10 61 5	17 1.60	1 350
United States-:	3,924	800	779	1,624	1,597	394	404]	495,	758	941	و ۱۲موجد	11,463	1,152







